STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTTION
ADMINISTRATIVE SERVICE CENTER
OFFICE OF PROCUREMENT AND CONTRACTS
1727 30TH STREET, 4TH FLOOR
SACRAMENTO, CA 95815-3800

Agency Specification

Thermoplastic Traffic Striping Material,
Alkyd Binder, White and Yellow

1.0 SCOPE This specification covers a reflectorized thermoplastic pavement striping material that is applied to portland cement or asphalt concrete road surfaces in a molten state by mechanical means. Upon cooling to normal pavement temperature this produces and adherent reflectorized stripe capable of resisting deformation by traffic.

2.0 SPECIFICATION AND STANDARDS Specifications and standards referenced in this document in effect on the opening of the Invitation for Bid form a part of this specification where referenced.

3.0 REQUIREMENTS

3.1 Composition: The thermoplastic material shall be 100 percent solids. The binder shall consist of a maleic-modified glycerol ester of rosin and plasticizer and be homogeneously incorporated with all the prime pigments, fillers and glass beads to produce a traffic coating to meet the requirements as specified herein.

3.2 Form: The thermoplastic material shall be supplied in either block or granular form as required in the purchase request.

3.3 Application Type: The thermoplastic material shall be formulated as required in the purchase request.

3.4 Characteristics of the Finished Thermoplastic: California Test Method 423 unless otherwise specified.

		White	Yellow
3.4.1	Glass Beads, AASHTO M247 TYPE 1, percent by weight	25-30	25-30
3.4.2	Inert fillers, insoluble in hydrochloric acid, % pass, USA Standard Sieve 150Φm ASTM E11	100	100

Cancels & Supersedes 8010-21C-19 and 8010-19
>Indicates Revision (Excluding State Spec. No. and Date)

3.4.3	Binder, percent by weight, minimum	18	18
3.4.4	Specific Gravity, maximum	2.15	2.15
3.4.5	Ring and Ball softening point	93-121	93-121

ASTM E28, °C

.1.1 Test on material after 4 hours heat with stirring At 218°C ± 1ºC, which includes 1 hour for the Meltdown and temperature stabilization.

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			White		Yellow
3.4.6.1	Tensile bond strength to an unprimed sandblasted portland cement concrete block, 3.2 mm thick film drawndown at 218ºC, tested at 24º ±1ºC MPa, minimum		1.24		1.24
.1.1.2	Brookfield Thermosel Viscosity, Spindle SC4-27, 20 RPM at 218ºC, Pa.S				
	Extruded Type		4.5-10		4.5-10
	Low Viscosity Type, maximum	3.0		3.0	
3.4.6.3	Impact Resistance, ASTM D2794, 3.2mm thick film drawndown at 218ºC on an unprimed sandblasted, portland cement concrete block, Male indentor 15.9mm, no Female die. Test at 24º ± 1ºC, kg-m cracks or bond loss, minimum.		0.58		0.58
3.4.6.4	Daylight luminous Reflectance AASHTO Designation: T 250-94, minimum		80		-----
.1.1.3	Color-yellow, shall match Fed 595, color No. 33538 and chromaticity limits shall lie within HUE = 580-583.5 nm, Chroma x =0.7050-0.5000 y and Brightness Y =42-59 measured according to California test method Cal 660.				
3.4.6.6	Yellow Index, AASHTO Designation: T 250-94 calculated as Y.I.=100(A-B)/G, maximum		10		
.1.1.4	Ultra Violet Light and Condensate Exposure, ASTM G53 . 300 Hours Total: alternate 4 hours condensate exposure at 40ºC, 4 hours UV exposure at 60ºC.				
	White – Yellowness Index, maximum		20		------
	Yellow – Must meet chromaticity limits As specified in 3.4.6.5.		------		Pass
.1.1.5	600-850Φm, 0.15 Mpa air pressure, and cast sample 12.7cm x 12.7 cm x 0.95cm g loss, maximum.		10		10
.1.1.6	Harness, Shore A-2 Durometer with 2 Kg weight at 46ºC		45-75		45-75

3.5 Other Requirements: The thermoplastic material shall readily apply at temperatures between 204ºC - 232ºC .

When applied to the pavement, the thermoplastic material shall be sufficiently tack-free to carry traffic in not more than 2 minutes when pavement surface temperature is at 10ºC, and not more than 10 minutes when pavement surface temperature is 54ºC.

When tested According to California Waste Extraction Test, Title 26, California Code of Regulations Section 22-66700, granular yellow thermoplastics shall have an extractable lead content of less than 0.3mg/L.

3.6 Workmanship: The pigment, beads, and fillers shall be well dispersed in the binder. The material shall be free from all skins, dirt, foreign objects, and other deleterious substances, and shall be of such composition that it will not bleed, stain, or discolor when applied to pavements.

Thermoplastic material shall not emit fumes which are toxic or injurious to persons or property when it is heated to application temperature. The material shall not emit excessive smoke during heating or application.

3.7 Shelf Life: The material shall maintain the requirements of this specification for a minimum period of one year. Any materials failing to do so shall be replaced by the manufacturer at his expense.

3.8 Air pollution compliance: This material shall comply with all applicable air pollution control rules and regulations.

3.9 Material Data Safety Sheets: Material Data Safety Sheets shall be provided by the manufacturer to include HEALTH HAZARD information on the material when it is heated to application temperature.

4.0 QUALITY ASSURANCE PROVISIONS

4.1 Inspection: This material shall be sampled and inspected as deemed necessary.

The minimum size batch of thermoplastic traffic striping material sampled and tested shall not be less than 907kg unless the total order is less than this amount.

All thermoplastic material intended for use by the State of California must be sampled and approved by the Transportation Laboratory before shipment. Manufacturer within the State of California must contact the Berkeley or Los Angeles Inspection Office for sampling procedures.

Manufacturers outside the State of California must submit the following information before shipment.

1. State specification number
2. Color, white and yellow and tons of each
3. Form - block or granular
4. Type – extruded or low viscosity
5. Exact address of shipment
6. Number and identification of batches comprising shipment
7. Date of manufacture
8. Purchase order or contract number

The above information is to be sent to, Office of Materials Engineering and Testing Services, 5900 Folsom Boulevard, Sacramento CA 95819. On delivery, the thermoplastic will be sampled for compliance to specification. Material not meeting the specification shall be removed and replaced by the manufacturer at his expense, including all cost for handling, testing and shipping.

4.2 Testing: All tests shall be performed according to the specified test method, latest revision. Qualitative and quantitative analysis may also be performed by X-ray diffraction,
X-ray emission, infrared and other instrumental methods of analysis, at the option of the Department of Transportation.

5.0 PREPARTION FOR DELIVERY

5.1 Packaging:

5.1.1 Block Form: The thermoplastic material shall be packaged in suitable containers to which it will not adhere nor interact with during shipment or storage. The blocks of cast thermoplastic material shall be approximately 89x30x5 cm and shall weigh approximately 23kg.

5.1.2 Granular Form: The thermoplastic material shall be packaged in meltable bags, which are compatible with the thermoplastic and shall weigh approximately 23kg. The containers must have sufficient strength and be properly sealed to prevent breakage and leakage during normal handling.

5.2 Marking: Each container label shall include: State Specification Number, color, type of binder, low viscosity type or extrusion type, manufacturer's name and address, date of manufacture, and batch number. All marking on containers shall be legible and permanent. Marking shall not smear or rub off container. Containers failing to meet marking requirements will not be accepted.

The containers and labeling shall meet all applicable U.S. Department of Transportation and Interstate Commerce Commission regulations. Concerning the contents, each container shall be labeled with such warnings or precautions as are required by local, state and Federal laws and regulations.

6.0 NOTES

6.1 Certificate of Compliance: The manufacturer of thermoplastic materials shall furnish the Engineer with a Certificate of Compliance in conformance with the provisions of the Department of Transportation Standard Specifications, January 1984, Section 6-1.07, "Certificate of Compliance". The certificate shall also include a list, by title and section, of all applicable state and federal packaging and labeling laws and a statement that all requirements have been meet.

Certificates of Compliance shall be sent of California Department of Transportation, 5900 Folsom Blvd., Sacramento, California 95819

6.2 The Contractor shall assume all costs arising from the use of patented materials, equipment, devices or processes used on or incorporated in the work, agrees to indemnify and save harmless the State of California and its duly authorized representatives from all suits at law or action of every nature for or on account of the use of any patented materials, equipment, devices or processes.